FACILITATING PUPIL THINKING ABOUT INFORMATION LITERACY

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Abstract

Whilst information literacy is frequently taught through the imposition on learners of an established framework, this paper suggests a different approach by taking a lead from James Herring's ideas. Specifically, it provides guidance to school-based information professionals who would like to encourage their pupils to devise their own flexible, information literacy models which are unique to them. Drawing on existing material in information science and wider thought, it proposes areas for coverage and considers how information professionals may support the dynamic process of model construction. It is recommended that those who are intent on facilitating the creation of personal information literacy models help pupils to identify the roles they take on in their lives, to reflect on the information needs that result, to ascertain the information they require in particular situations, to explore their information-seeking activities, to consider means by which information can be captured and to give thought as to how the information they have accessed may be used. This framework is, however, by no means rigid and readers are, of course, free to make their own adjustments.

Introduction

There is no shortage of advice available to any information professional wanting to instruct young learners in how to find and use information effectively and ethically. Indeed, for many years now, a wide range of models devoted to information literacy has existed. It is important to clarify at once what is meant by the word "model" in this context. Whereas many models in information science are generalised representations of reality, focusing on the typical characteristics or elements of the phenomenon or process under scrutiny, and emphasising their inter-relationships, models of information literacy are here understood to embody good practice and present an exemplary basis for future action on the part of the learner (Shenton 2006, 2). One of the earliest such models was devised

by Marland (1981, 30-37). Today, his work is rightly regarded as a landmark in the establishment of the information skills agenda within schools and his creation may be thought of as something of a prototype for the structures that have followed. Typically, the frameworks of Marland and his successors list for educators the information literacy skills to be taught, whilst indicating to the pupil the steps they should take when faced with any major task that necessitates locating and exploiting information.

A recurrent theme in the literature is the observation that models of information literacy share a range of common elements with regard to their content. In the mid 1990s, Herring commented that there was "much overlap between the range of information skills outlines" and that "different researchers have produced similar but different lists" (1996, 17, 25). Over a decade later, Bawden and Robinson defined more specifically the nature of the common ground, asserting that a sequence of "recognising a need for information – choosing the best sources – accessing information – evaluating information – organising and storing information – communicating and using information" was typical (2009, 187). The shared characteristics of four of the models that are particularly well known in the US are well demonstrated by Eisenberg. Asserting that "there is more agreement than disagreement among the models", he presents the components of the four in question side by side so that the commonalities in their elements are obvious (Eisenberg 2008, 40, 41).

In a recent book, Herring makes a somewhat radical suggestion. He raises the possibility that youngsters may be encouraged to develop their own information literacy models (Herring 2011, 87-88). There are several benefits of this approach – pupils are given the freedom to create a framework that suits their preferred learning style; reflection is promoted and the prospect that the relevant skills will be transferred across subjects and retained over time may be increased. Undoubtedly for some readers understanding the concept of an information literacy model in the terms advocated by Herring will require something of a paradigm shift in their thinking. As Limberg and Sundin point out, traditionally information literacy literature tends to adopt a "teaching perspective" and it is studies of information-seeking that take a learners' perspective (2006). Bastone reminds us that one way of understanding information literacy is to see it as something a student *does* at college (2001, 9), arguably in much the same way as one might receive instruction in Mathematics or English, for

example. In addition to being taught through a sequence of processes, information literacy may be viewed as the product of the relevant set of learning experiences that the individual has undergone at the hands of various educators; if the approach recommended here is accepted, instead of being a passive recipient at the hands of all-knowing instructors, the person actively constructs their own sense from the totality of their experiences with information.

By highlighting the sorts of issues that youngsters may be asked to consider at various points within the spectrum of information behaviour in order to devise a model of the kind envisaged by Herring, this article offers some ideas that would be realistic at the secondary school level. Thus the youngsters whose information literacy could be developed through the method advocated here are eleven- to eighteen-year-olds. It should be understood from the outset that the paper does not aim to put forward a model of information literacy itself; nor is it the intention here to restate – yet again – the need to teach areas whose importance is already widely accepted. The article is much more concerned with suggesting pointers for the construction of a personal model and highlighting existing frameworks in relation to particular phases within information behaviour which could usefully inform or become assimilated into such models. The paper is predominantly aimed at the school-based information professional, although it will also be of interest to classroom teachers who take a keen interest in developing the information skills of their pupils.

Phases of Facilitation

Drawing on their own experience as educators and researchers, on their knowledge of the published material pertaining to information literacy and the closely related area of information behaviour and on their awareness of wider thought relating to the nature of information and knowledge, the authors propose six elements which might be addressed by information professionals in order to enable the youngsters with whom they work to develop their own flexible models of information literacy.

1. Identifying roles

Nanus recognises that information needs are closely associated with the roles people assume in their lives (1981, 56). A single individual may fulfil the functions of, for example, citizen, consumer,

employee/manager, son/daughter, parent, carer, head of the household, voluntary worker and hobbyist. Whilst the range is bound to be narrower for a teenager, it is unlikely that their roles will be restricted to that of a school pupil, even though many information literacy models would appear mainly or even exclusively concerned with this dimension. An appropriate starting point for the formulation of a personal model lies in helping each youngster to define their own roles. Since these reflect the specific circumstances of that particular individual, thinking in this direction can assist the person to lay the foundations for an overall information literacy model that is peculiar to them.

2. Reflecting on information needs

A second step involves inviting the learners to explore how, by taking on certain tasks and responsibilities that pertain to the roles they have noted, they have had to deal with emergent information needs. Pupils may consider the way in which each such need that they have experienced recently first arose, the need's relationship to any wider "problem situation" and the course of its development. Did, for example, the need follow the sequence outlined by Taylor, in which the deficiency initially manifests itself as a vague and inexpressible dissatisfaction before progressing in a manner that eventually enables a "qualified and rational" statement to be constructed (1968, 182)?

Another approach is to categorise, in accordance with a typology presented by Dervin, the "life situations" that have led to the needs. The four scenarios she defines are:

- *decisions*, in which a choice is to be made from the options available;
- *problems*, where a barrier hampers the individual's progress;
- *worries*, in which the person is hindered by a lack of predictability and control;
- *comprehendings*, where the individual is seeking to understand

(Dervin 1976, 332).

In terms of information needs more specifically, it may be instructive for the youngsters to group the identified needs on the basis of one of the established frameworks (such as Minudri 1974, 158-59; Walter 1994, 120; Latrobe and Havener 1997, 190; Shenton and Dixon 2003, 37-39; Agosto and Hughes-Hassell 2006, 1419). Where the numbers within a category are especially large, sub-division may be advisable. For instance, the mass that we can label "school-related curricular

information needs" may be split up according to the subject or the underlying purpose (e.g. was the information required for background reading, examination revision or an assignment?) Are there other patterns that emerge across different need situations? Exploring past situations in this way helps youngsters to think more critically about future needs that they experience and they are able to draw comparisons with previous, related circumstances more easily.

3. Ascertaining information requirements

This phase effectively bridges the gap between the need situation and the beginning of the actual pursuit of information. Based on their recollections of the scenarios addressed in the second stage, pupils here indicate the particular qualities they expect to be inherent in the information they would eventually seek. If youngsters are able to specify the essential features for themselves as a result of their own experience of real life situations, instead of the prerequisites forming a set of criteria imposed by another party, they are more likely to be seen as genuinely important. Clearly, the attributes will vary to some degree according to the circumstances but, where the youngster is successful in isolating the *typical* characteristics that are necessary and recording these in their model, this encourages the user to take a proactive stance with regard to information requirements when conducting a future search during which the model is consulted, rather than merely respond to what is retrieved. All too often, actual behaviour is very different – as soon as many youngsters are faced with a task that demands they find information, they tend to go unhesitatingly to the resources that they employ habitually, typically those accessible via the World Wide Web, and accept with little thought the material made available by the first site they consider at all satisfactory. Youngsters who really struggle to formulate their own criteria that must be met by the information they seek may be asked to reflect on the value in terms of their own experience of the evaluative questions that can be found in an existing information literacy framework, such as the ten-point model that has been offered by the authors previously (Shenton and Pickard 2012, 24), and then base their subsequent proactive explorations of information on what they have learnt from such tools.

4. Exploring information-seeking activities

At its simplest, information-seeking action may be defined as what is done by the individual in order to satisfy a recognised information need. In an earlier paper, one of the authors has explained how information-seeking may be deconstructed on the basis of two key dimensions: the *where/what* and the *how* (Shenton 2004, 244-45). The former relates to the environment in which the activity takes place and the nature of the resources involved, whilst the latter is concerned with the strategies and skills applied by the user. One approach to considering past information-seeking action is to address, in all these respects, what was done by the individual acting on each of the needs identified in stage two. *How* may be interpreted on two entirely different levels – it may relate to the methods used to locate appropriate information sources, through, for example, the use of a library catalogue, and also how information is found within a source that has been chosen for scrutiny. In a book context, finding aids, such as contents lists and indexes, and reading strategies like scanning and skimming may well come into play.

This fourth phase also provides an opportunity for the learner to think more broadly about other information environments that may be of help, the range of options available in relation to the resources that are accessible and the tactics/skills that may be needed to find the information and ensure that what is ultimately selected satisfies the requirements stated in stage three. Not only do youngsters need to think of the various techniques that enable them to make evaluative judgements on information as effectively forming an armoury of skills; they must be encouraged to think critically about each of the methods themselves. Such a mindset can often be stimulated by the information professional highlighting specific situations that reflect wider truths. Let us take a case in point. Very often youngsters are urged to test the accuracy of information found in one source against that offered by another. In his "checklist of information skills", Paterson, for example, urges pupils to evaluate material by comparing content from different places (1981, 9). The wisdom of this approach extends into various other aspects of life. In reflecting on trust in journalism, Marr acknowledges that it can be contentious to rely on a single source when making major claims during the reporting of a significant news story (2005, xiv). Yet, in an information-seeking connection, cross-source corroboration is a viable option only, of course, if the materials used to provide the verification are themselves trustworthy. Where this is not the case, the danger arises that incorrect material in the original source

may be seen to be "confirmed", rather than exposed for what it is. The autobiography of actress Elisabeth Sladen, who is especially famous for her roles in *Doctor Who* and *The Sarah Jane Adventures*, provides a vivid insight into how a single inaccuracy can soon become widely reported "fact":

> "I was born on 1 February 1946. That's right, 1946. My daughter Sadie has a wicked sense of humour and she is forever laughing at articles that list my birth as 1948. 'Here's another one, Mum. Someone else who wasn't done their homework.' I think my agent was asked for my age once in 1970 and he gave the wrong answer and that's the year that has appeared in every piece of print ever since" (Sladen and Hudson 2011, 11).

Patterns may be detected across individual instances of information-seeking and a rationale should be established for taking a certain form of action depending on the type of situation. It is pertinent to note that certain norms have arisen with regard to how information is found in particular contexts, each of which may correspond closely to one of the personal roles identified in stage one. As Lloyd asserts, "people participating collectively in a social setting bring practices such as information literacy into being, and shape it in ways that are collectively agreed upon through negotiation, and in ways that reflect the practice traditions of the setting" (2012, 774).

5. Addressing information capture

Although frequently a significant element in the overall sequence of processes, information capture tends to receive relatively little attention in information science literature. Still, it has formed the subject of a fairly recent paper by one of the authors (Shenton 2010). In addressing information capture, the user casts their mind back to the events that immediately followed the location of suitable information in the scenarios recalled. In particular, was it necessary to reproduce this material for later consultation, through, for example, photocopying, scanning, printing it out or taking a screen shot? The making of notes may be a slightly different form of activity. If the content is copied verbatim then this has much in common with the results of the aforementioned processes but note-making often marks the beginning of the individual's attempts to relate the material to their existing knowledge base and thus their record effectively adds value to the information that has been discovered.

6. Recording information use

The broad phase of information use encompasses how the material that has been identified as appropriate is exploited in order to resolve the situation that led to the pursuit of information. It may mean creating a tangible end product, such as an essay or report, making a decision or tackling a problem. If, however, the motivation was *intrinsic* and information was sought simply because of a desire to *know*, the achievement of the informed state may form the culmination of the information use phase. Where the stage of information use is more protracted and multi-faceted, as may be the case if a lengthy academic assignment is to be produced, it could be necessary to break it down so that typically occurring sub-tasks are delineated. These may include, for example, bringing together information from different sources, developing an understanding from the totality, writing a piece based on this comprehension and incorporating extracts as direct quotations.

Although identifying one's information needs and putting information to use are elements that are positioned at very different places in the overall sequence presented here, the connection between them is strong. Indeed, when information has been found and exploited effectively, one way in which researchers can develop an insight into the person's underlying information need lies in exploring the nature of the end product or enhancement of knowledge that has ultimately resulted, since it was the aim of attaining this "goal state" which prompted the individual to take information-seeking action. As Line recognises, a "use usually represents a need of some kind" (1974, 87). It is important to appreciate that certain frameworks associated with information use can also be used at an earlier stage in order to help learners clarify more precisely the nature of their information needs. Although Todd presents his "information intents" in the context of information utilisation, the fact that he is concerned with the drivers that lie behind this element endows his set of constructs with clear value in relation to understanding information needs as well (2005, 199-200).

The Role of the Information Professional and Peers

The authors recommend that work on the pupil's part to create their own model of information literacy should consist of three elements:

a) *deconstruction* – interpreting the individual stages of information behaviour in terms that are relevant to them personally;

b) *reflection* – recalling and examining specific experiences from their lives that pertain to the phases identified;

c) *abstraction* – forming overall generalisations derived from patterns that have been detected in relation to their own situations.

The cognitive burden imposed by the task of model construction is not to be underestimated and it is unrealistic to expect secondary school pupils to create their own models of information literacy with minimal assistance. In Krathwohl's revision of Bloom's Taxonomy, the ability to create, which is defined as "putting elements together to form a novel, coherent whole or make an original product", is postulated as the most complex cognitive process category (Krathwohl 2002, 215). Since the construction of a personal model involves the combination of a range of skills and areas of knowledge/understanding in order to assemble a generic framework for thinking and action, and the result will obviously be unique to that individual, the activity clearly satisfies the various criteria associated with Krathwohl's "create" category and may well prove one of the more challenging that some youngsters will undertake in their time at school.

Pupils are likely to need particular support when generating the model's abstractions, since, undoubtedly, the ability to think in this way is a high level skill. The demands of abstract thought are well appreciated by Kuhlthau, who associates it with Piaget's formal operations phase – "the final stage of cognitive development", and one which, she suggests, is not attained by some individuals until after high school (1988, 55). Nevertheless, various strategies are available to the information professional who is intent on facilitating the construction of abstractions. They may, for example, ask the learner to consider from the outset a range of situations with which they are familiar and note commonalities; an alternative lies in inviting the person to concentrate initially on one situation known to them, identify the issues that the scenario illustrates and expand their understanding in the light of their other experiences.

Success in constructing an effective model which can guide future action is dependent in no small measure on the skill of the information professional in stimulating thinking by raising sufficient issues for consideration but stopping short of offering so detailed a framework that the youngster need do little more than fill in a few strategically placed gaps. Certainly, the danger arises that, in order to

render each of the six stages more meaningful to learners, the information professional goes too far in issuing guidance by embellishing the generic actions outlined above with lots of pertinent illustrations. Whilst it is true, as Cooke (2003) reminds us, that all "abstractions are better understood through examples", if the ultimate framework is to be a truly *personal* model of information literacy, then obviously enough scope must be allowed to ensure that it is genuinely rooted in the youngster's own ideas, and it is impossible to create the model simply by rehashing material that has already been given to them.

When employed in concert with the activities of reflecting and recording, peer discussion frequently facilitates the development of a more open mindset among pupils, with learners not only recognising good practice in their own behaviour but also becoming acquainted with more effective methods after inputs from others. The information professional should remain alive, too, of course, to opportunities to make *their* own observations which will further help to increase the individuals' information skills and broaden their perspectives.

In discussing the relevance of the zone of proximal development to children's use of libraries and information, McKechnie explains how Vygotsky took the view that new cognitive skills are first practised by young people during social interaction with a more experienced individual until the skill is mastered and internalised. At this point, the youngster is able to exercise the skill independently (McKechnie 1997, 67). In terms of personal models of information literacy, this raises the possibility that, by demonstrating how they apply their own model in particular situations, the adult can guide the youngster's attempts until use of *their* model becomes habitual.

The Model's Construction, Presentation and Growth

The purpose of this article has been to suggest some issues for consideration by learners when they construct personal models. The individual stages and associated questions that might be put to pupils are listed in the Appendix. Information professionals familiar with the literature may well be keen to incorporate extra prompts derived from existing information literacy frameworks and to draw on pertinent theories of information behaviour. Any reader wishing to pursue the latter is advised to

consult an invaluable volume edited by Fisher, Erdelez and McKechnie (2005) which affords an introductory guide to over seventy such theories.

The stages outlined above offer a *possible* structure to promote reflection and self-analysis by pupils – they are not intended to be a definitive set of steps that should be imposed. It may be that, when they scrutinise their own information behaviour, the learner identifies areas that have not been covered here but which could, nonetheless, legitimately be included in their personal model. Bawden and Robinson, in fact, warn against understanding information literacy in terms of a sequence of widely accepted steps. They acknowledge the value of this mindset in structuring training but lament that it fails to do justice to the true complexity of information behaviour and the personal inclinations of different individuals (Bawden and Robinson 2009, 187). A major challenge for the information specialist who is encouraging the development of the kind of models that have been the subject of this paper lies in ensuring that the necessary freedom of expression in composing them is given to learners whose effective behaviours do not fit the archetypal pattern.

Readers should appreciate that, whilst the individual stages presented in this article have been numbered in a way that perhaps implies that stage six amounts to a "resolution", an iterative aspect is common when information is actually found and exploited. For example, the act of using information that has been retrieved (stage six) may reveal further, more specific needs, so effectively returning the sequence to stage two. This circularity in information behaviour is comparable to what Bronowski, in a highly acclaimed work, calls "the crucial paradox of knowledge". He explains,

> "Year by year we devise more precise instruments with which to observe nature with more fineness. And when we look at the observations, we are discomforted to see that they are still fuzzy, and we feel that they are as uncertain as ever. We seem to be running after a goal which lurches away from us to infinity every time we come within sight of it" (Bronowski 1976, 356).

In terms of both our own pursuits of information and man's cutting edge attempts to acquire "new" knowledge, then, the action that is taken in order to find out more leads to a recognition of the need to learn more still. There may be other deviations from a neat, linear sequence from need to resolution, too. Despite the learner's best efforts to identify their information requirements in advance of a search, it may be only when unsatisfactory material has been discovered that the individual is able to isolate all the necessary characteristics of the information they are seeking.

The form that is taken by the model must be intuitive to the learner. Many models are conveyed diagrammatically and, in schools where mind maps or other modes of visual representation are championed, the youngster may be keen to set down their model in a manner that allows them to draw on the skills they have already developed in these areas. Information professionals looking to introduce learners to methods that may be new to their pupils, though, may take inspiration from the "charting" ideas that Kuhlthau suggests in relation to the Information Search Process (2004, 138-39). She defines "charting" in this context as "visualizing ideas, issues, questions, and strategies" (Kuhlthau 2004, 135).

In institutions where particular techniques for thinking are advanced, information professionals may wish to highlight links between these and the processes associated with information literacy. Making appropriate connections not only helps the school to demonstrate the widespread applicability of the advocated techniques; it also enables the pupil to comprehend elements of information literacy in terms with which they have become familiar. In an earlier article, one of the authors has posited how an essential equivalence may be detected across key strands of information literacy, the generic research process and scientific inquiry (Shenton 2009, 230). It is beneficial if teachers in the classroom emphasise this relationship, since, by offering instruction in one of these areas, they can effectively reinforce the learners' understanding of the other forms of academic investigation as well.

It must be stressed that this article has addressed the *early* stages involved in the construction of a personal model of information literacy. Herring envisions that the outcome is not static; it is developed by the pupil whilst they progress through the rest of their time at school. The Lewinian Experiential Learning Model explicated by Kolb shows how, after forming abstract concepts and generalisations, the individual may test their implications in new situations (1984, 21). In the context of information literacy, it is perhaps useful to think of the personal model as an agile creation that is not *tested* as such but is refined and enriched by the individual as they undergo new experiences. Nevertheless, the fact that concepts which have been formulated by the learner as a result of their experience are here flexible, rather than immutable, is consistent with Kolb's fundamental principle that knowledge is "continuously created and recreated" (Kolb 1984, 38). In short, any personal model

of information literacy amounts to a work in progress and does not aim to provide a definitive statement.

It is worthwhile before closing to consider some concrete examples of how a personal information literacy model may develop as a pupil matures. In the early stages, the learner's understanding of the strategies that may be used to evaluate information is likely to be rudimentary. Foster and Urquhart point out, however, that the process of verifying information may be subject to "a scale approach" (2012, 797). In practice, this may mean that, over time, the individual comes to appreciate that they can employ approaches of varying levels of complexity according to the type of situation involved. It may also be the case that, with greater experience, youngsters become adept at applying to their information behaviour knowledge that they have gained in other contexts. For example, they may begin their attempts to evaluate information by employing a small group of general critical thinking skills but, with time, they are able to improve their techniques by bringing to bear insights that they have gained from ICT lessons and which are more specific to the online environment. Such duality is advocated, in fact, by Miller and Bartlett (2012, 39).

Conclusion

This paper has explored how an information professional may seek to promote the creation of a personal information literacy models by pupils in secondary schools. No claim is made that work of this kind is easy. On the contrary, the demands that it places on the learner are substantial, especially since the process includes the adoption of an abstract perspective that will be challenging to many. For their part, those providing the appropriate guidance may be disconcerted by the extent to which they themselves must move between concrete situations and higher level generalisations, and the task of integrating ideas from different sources to enrich the teaching programme as far as possible may demand a considerable effort in becoming acquainted with the relevant literature.

Whilst, in their totality, each personal model provides a generic basis for effective information-seeking action, it must be agile, too, affording scope for its the creator/user to employ different tools and techniques according to the different circumstances in which they find themselves, and will develop as the youngster's experience increases. From the outset, the pupils should be

allowed freedom to choose a favoured format for their model, although this may change over time as the model's complexity increases and the learner becomes familiar with more presentational methods.

Even the core elements within the model may vary from one individual to another, as, in each case, they will reflect activities that the learner personally deems important. When the model is actually used, it must be ensured that the individual does not merely mechanically follow a set of steps within their framework. Where this is done, there is little difference between a model of the sort championed in this paper and the prescribed information literacy models that are routinely seen in the literature.

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APPENDIX: POSSIBLE PROMPTS FOR THE PUPIL

Thinking About Information Literacy

1. Roles

What functions do you take on in life?

2. Information Needs

How have these roles given rise to needs for information?

Consider in detail some of the situations in the recent past when you have needed information.

Can these information needs be traced through individual stages of development?

Can the needs be grouped or other patterns be identified across them?

3. Information Requirements

What criteria had to be fulfilled by the information that was necessary to meet each need?

4. Information-seeking

What action was taken to satisfy each need?

Where did you go?

What did you use?

How did you exploit the appropriate tools and sources?

How did you ensure that the material you have opted to retain was sound?

Are there significant patterns across the different episodes of information-seeking?

Can you justify why you took the action you did in each instance?

5. Information Capture

Did you make a copy of the information you thought was important?

If so, how was this done?

6. Information Use

How did you use the information in order to meet the need that prompted you to take action?

If several steps were involved, what were they?

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